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EXAMINER

YAO, SAMCHUAN CUA

ART UNIT	PAPER NUMBER
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1733

DATE MAILED: 02/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/943,677

Applicant(s)

COFER ET AL.

Examiner

Sam Chuan C. Yao

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 December 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 25 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Mayama et al (US 4,530,779). See column 4 lines 21-37, figure 4.

Mayama et al teaches fiber bundle being impregnated with a titanate coupling agent by passing the fiber bundle through a bath of the coupling agent (figure 4). This process must inherently apply "*a composition ... in an amount sufficient to coat substantially all of a plurality of fibers*". In fact, in applicant's own disclosure, the coating operation is performed by dipping a bundle of fiber in a bath of wetting agent (see claim 1 and figures 2A-2B, for instance). It is interesting to note that, in figures 2A and 2B, a bundle of fibers only passes through a single roller disposed in a wetting agent bath (i.e. shorter impregnation time), while a bundle of fibers taught by Mayama et al has to pass through two rollers disposed in a coupling agent bath (i.e. longer impregnation time). If the process illustrated in figures 2A and 2B of applicant's process can apply "*amount sufficient to coat substantially all of a plurality of fibers*", it would be reasonable to expect the same for Mayama et al.

Note further: Where ... the claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical

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processes, the PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his claimed product. **Whether the rejection is based on "inherency" under 35 USC § 102, on prima facie obviousness" under 35 USC § 103, jointly or alternatively, the burden of proof is the same, and its fairness is evidenced by the PTO's inability to manufacture products or to obtain and compare prior art products."** In re Best, 562 F2d 1252, 1255, 195 USPQ 430, 433-4 (CCPA 1977).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-3, 6-20, 25-26, 29-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 98/06551 in view of Bonazza (US 5,089,326), Kosuga et al (US 4,960,642), and (Devanathan (US 4,978,360) or Mayama et al (US 4,530,779)).

With respect to claim 1, WO '551 discloses a process of making a sheathed impregnated fiber strand in a form of heat-moldable pellet, the process comprises:

impregnating synthetic reinforcing fibers such as carbon or graphite fibers with an organic wetting agent in a pan to "coat substantially all" reinforcing fibers (abstract; page 6 lines 1-14; page 8 lines 5-32; page 9 lines 11-25; page 14 lines 14-23; page 24 lines 10-28), wherein the amount of wetting agent applied is preferably around 5-15% by weight (page 16 lines 19-30); forming the impregnated reinforcing fibers into a preimpregnated bundle or strand (page 16

lines 13-32); encasing the preimpregnated strand with a thermoplastic material to form the sheathed impregnated fiber strand (page 60; claim 1). WO '551 does not teach coating carbon fibers with a metallic material. However, it would have been obvious in the art to coat the carbon fibers taught by WO '551 with a metallic material in making a sheath impregnated fiber strand (i.e. heat-moldable pellet), because: a) WO '551 is open to using virtually any known reinforcing fibers as evidence from the following passage, "... *and other non-glass materials having suitable reinforcing characteristics*" (page 14 lines 19-22; page 47 lines 27-28); b) Bonazza teaches using metal coated carbon fibers in making a fiber-reinforced composite, the composite has increase conductivity over a normal carbon fiber reinforced composite, thereby making it ideal for EMI shielding application, and also "*provides good mechanical properties and convenient processability*" (abstract; col. 3 lines 16-30; col. 5 lines 11-33, lines 63-68; col. 6 line 65 to col. 7 line 5); and, it is old in the art to form heat-moldable pellets from metal-coated glass (i.e. reinforcing) fibers for use in making EMI shielding material (col. 1 line 8 to col. 2 line 31).

WO '551 does not teach feeding conductive fibers into a bath of wetting agent to impregnate the conductive fibers. However, it would have been obvious in the art to impregnate electrically conductive reinforcing fibers with an organic wetting agent, by feeding them into a bath of the organic wetting agent, because it is a well known and conventional in the art to feed reinforcing fibers into an organic resin bath in order to effectively impregnate the reinforcing fibers with the organic

resin as exemplified in the teachings of Devanathan (col. 2 lines 3-14; figure 1) or Mayama et al (figure 4).

With respect to claim 2, see page 6 lines 13-14 and claim 2 of the WO '551 patent.

With respect to claim 3, see claim 17 of the WO '551. In light of the similarity of the production processes, the molded pellet in the process of WO '551 must naturally form a composite having an electromagnetic shielding characteristics, and the organic wetting agent also must naturally enable an even distribution of the fibers in the composite.

With respect to claims 4-5, it is a notoriously common practice in the art to metallically coat carbon fibers by electroplating process.

With respect to claims 6 and 8, see figure 1 of the Devanathan patent.

With respect to claim 7, one in the art would have applied a workable processing speed to ensure that fibers are effectively impregnated with an organic wetting agent.

With respect to claims 9-11 and 13, see page 17 lines 19-24; page 18 lines 5-19; and page 24 lines 10-28 of the WO '551 patent and figure 1 of the Devanathan patent.

With respect to claim 12, see page 52 lines 13-18 of the WO '551 patent.

With respect to claims 14, 16 and 18, in order to enhance production efficient, the limitation in this claim would have been obvious in the art. See figure 4 of the WO '551 patent.

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With respect to claim 15, see page 31 lines 31-32 and claim 3 of the WO '551 patent.

With respect to claim 17, one in the art would have determined, by routine experimentation, suitable pellet size for the desired end-use of the process.

With respect to claims 19-20, see page 6 lines 21-30 of the WO '551 patent.

With respect to claims 21-24, since: a) WO '551 teaches impregnating fibers with a film forming organic matrix in forming pellets (page 9 lines 11-25); b) a wax is a well known film forming organic matrix; and, c) Kosuga et al, drawn to a process of making pellets, teaches impregnating a electrically conductive fibers with a wax to enhance a wettability of conductive fibers so that the fibers can be dispersed uniformly in a matrix resin (col. 3 lines 6-32; claims 1-2), it would have been obvious in the art to impregnate conductive reinforcing fibers in the process taught by WO '551. As for the wax emulsion bath composition, it is conventional in the art to use a wax emulsion bath for impregnating fibers and the recited composition is taken to be old in the art. Moreover, the recited composition is taken to be a result effective variable, routinely optimized by those versed in the art. As for the desired amount of wax coating on the fibers, see claim 1 of the Kosuga et al patent and page 6 lines 21-30 of the WO '551 patent. As for claims 22-24, see claim 3 of the Kosuga et al patent. Moreover, the recited thermoplastic sheathing materials and recited pre-heating step are taken to be conventional in the art.

With respect to claims 25-28, these claims are mere repetitions of the above rejected claims, for the same reasons set forth above, these claims would have obvious in the art.

With respect claims 29-35, see claim 66 of the WO '551.

5. Claims 1-9, 11-20, and 26-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mayama et al (US 4,530,779) in view of WO 98/06551.

With respect to claim 26, since the amount of wetting agent recited in this claim is old in the art as exemplified in the teachings of WO '551 and since one in the art would have been determined, by routine experimentationm a workable composition in order to obtain the desired processing characteristics, this claim would have been obvious in the art.

With respect to claims 1-9, 11-20, 27-35, for essentially the same reasons set forth in numbered paragraphs 5-6, these claims would have been obvious in the art.

Response to Arguments

6. Applicant's arguments filed on 12-03-03 have been fully considered but they are not persuasive.

Counsel argues on page 6 full paragraph 4 that, "*Mayama ... does not appear to disclose that substantially all of a plurality if fibers comprising electrically conductive metal coated fibers are coated to form preimpregnated fibers*". Simply because Mayama et al does not explicitly disclose the recited "*applying a composition ... in an amount sufficient to coat substantially all of a plurality of*

fibers ...", it does not necessarily mean that this recited characteristic or feature is absent, especially when the production processes between the present invention and the prior art are indistinguishable. Nowhere does Applicant that a special process, other than dipping a bundle of fibers in a wetting agent bath, is needed to accomplish the above limitation. (see claim 1 and figures 2A-2B, for instance). This is the same as the process taught by Mayama et al as shown in figure 4. In fact, figures 2A and 2B of applicant's specification show a bundle of fibers being impregnated with a wetting agent by passing the bundle through a single roller disposed in a wetting agent bath (i.e. shorter impregnation time), while a bundle of fibers taught by Mayama et al has to pass through two rollers disposed in a coupling agent bath (i.e. longer impregnation time). If the process illustrated in figures 2A and 2B of applicant's process can apply "*amount sufficient to coat substantially all of a plurality of fibers*", it would be reasonable to expect the same for Mayama et al. Equally important, this limitation "*coat substantially ...*" merely requires more than 50% of all of a plurality of fibers being coated with a wetting agent.

Counsel argues, on page 6 last paragraph to page 7 line 5, that "*... it is believed that the WO reference implicitly teaches against such a use [metal-layer-coated carbon fiber]. That is, it would appear that the use of a metal coating on the carbon fiber, as might be taught by Mayama for EMI shielding or otherwise, would actually decrease the reinforcing properties of the fiber insofar as the interface between the metal coating and the carbon fiber would be a weak point*

in the composite which could lead to the failure thereof when subjected to shear or other loading.". Examiner strongly disagrees with Counsel's assertion.

Counsel's attention is directed to the teachings of Bonazza, where Banazza clearly teaches using metal coated carbon fibers in making a **fiber-reinforced composite**. The composite not only has an increase conductivity over a normal carbon fiber reinforced composite, thereby making it ideal for EMI shielding application, but it also "*provides good mechanical properties and convenient processability*" (emphasis abstract; col. 3 lines 16-30; col. 5 lines 11-33, lines 63-68; col. 6 line 65 to col. 7 line 5).

As for Counsel's argument on page 7 regarding the claims being rejected as being obvious over Mayama in view of WO '551, Examiner strongly disagrees with Counsel's assertion. There is no showing of unexpected benefit with respect to the amount of wetting agent applied onto a fiber bundle. WO '551 is merely cited that the recited amount is known in the art. It is respectfully submitted that, one in the art would have applied a workable amount of wetting agent so that metal-coated carbon fibers can be effectively encased with a thermoplastic or thermosetting material.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sam Chuan C. Yao whose telephone number is (571) 272-1224. The examiner can normally be reached on Monday-Friday with second Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571) 272-1226. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Sam Chuan C. Yao
Primary Examiner
Art Unit 1733

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01-30-04